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CORR Insights®: Satisfying Results of Primary Hip Arthroplasty in Patients with Hip Dysplasia at a Mean Followup of 20 Years

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Where Are We Now?

Despite improvement in prevention, secondary osteoarthritis resulting from developmental dysplasia of the hip (DDH) remains a difficult problem to solve for the arthroplasty surgeon.

This CORR Insights® is a commentary on the article “Satisfying Results of Primary Hip Arthroplasty in Patients With Hip Dysplasia at a Mean Followup of 20 Years” by Colo and colleagues available at: DOI: [10.1007/s11999-016-4998-6](https://doi.org/10.1007/s11999-016-4998-6).

The author certifies that he, or a member of his immediate family, has no funding or commercial associations (eg, consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might pose a conflict of interest in connection with the submitted article.

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This *CORR Insights®* comment refers to the article available at DOI: [10.1007/s11999-016-4998-6](https://doi.org/10.1007/s11999-016-4998-6).

When discussing surgical options, a surgeon must consider a number of issues including: (1) Restoring the center of rotation of the hip at the adequate level by implanting the acetabular component in the true acetabulum, (2) implanting an acetabular component in a poorly developed true acetabulum, which often needs an osseous reconstruction in order to achieve stability of the prosthesis, (3) reducing the femoral head into the true acetabulum, which may call for a shortening osteotomy to avoid sciatic nerve impairment [7], and (4) obtaining a durable result based on surgical technique, implant fixation choice, bearing surface [3, 13], and implant design [2].

More specifically, on the acetabular side, several technical aspects have been discussed and reported with acceptable and often similar results.

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Previous studies have advocated for the restoration of the hip center [4], whereas a high center of rotation is a valuable option for others [10]. Acetabular fixation has been done with [2, 4] or without cement [9]. Bone graft is another option [6], although a consensus is hard to find. Previous studies have favored bulk grafts [5], while others argue that both impaction autografting and allografting represent the best options [11].

Where Do We Need to Go?

We do not know which for acetabular reconstructive approach is best for patients with DDH. Surgeons tend to make decisions based on habits, opinions, or beliefs about the natural history of the condition or of particular reconstructive approaches; these might or might not represent good decision-making approaches. Currently, we lack good-quality evidence comparing various approaches at longer term. Hindering the development of such evidence are varying definitions of DDH [14], different stages of DDH [1]

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that might be included in any such comparative series, and widely varying ages at which patients with this condition present for arthroplasty. Heterogeneity of techniques used even within some series makes things still more confusing. It is, therefore, impossible to differentiate the relative importance of each parameter, and future studies will need to resolve these issues.

Analysis of the dysplastic hip often remains limited to two-dimensional radiographic analysis. The recent development of three-dimensional (3-D) analysis tools may provide additional information to improve planning, surgical technique, and long-term results.

How Do We Get There?

A unifying definition and classification of DDH is mandatory in order to improve the relevance of the reported results for larger populations. Registries could be a solution, but they have not focused their efforts on this specific topic except for the Norwegian [14] and the Danish registries [12]. Working on larger populations in a controlled environment may improve external validity because most of the reports on this topic are done by specialized units or surgeons. From a practical point of view, a multicenter database would be useful. International

societies should take the lead organizing online databases based on a collection of cases from experienced centers. These cases could then be analyzed uniformly, offering valid comparisons.

At an individual level, a 3-D analysis could improve planning capabilities and surgical technique. This can be done using 3-D analysis tools such as CT scan and/or an EOS® system (EOS® 3DServices, Paris, France). Xu and colleagues recently used CT scans in 16 Crowe Group IV hips [15], resulting in the successful implant of an acetabular component. However, some additional data may be obtained using the EOS® system in an upright position, as it can help the surgeon observe the relationship between the hip, pelvis, and spine [8]. This could be of interest as surgeons consider the various possible treatments of patients with this complex condition.

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